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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Benoit Couet

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Schlumberger Doll Research  
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EXAMINER

MILLER, ROSE MARY


ART UNIT

PAPER NUMBER

2856

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<p><b>Application No.</b></p> <p>10/088,723</p>	<p><b>Applicant(s)</b></p> <p>COUET ET AL.</p>	
	<p><b>Examiner</b></p> <p>Rose M Miller</p>	<p><b>Art Unit</b></p> <p>2856</p>	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 June 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-23 and 26-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1 and 3-15 is/are allowed.
- 6) ☒ Claim(s) 16-23,26-34 and 38-40 is/are rejected.
- 7) ☒ Claim(s) 35-37 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Specification***

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

2. Claim 39 is objected to because of the following informalities: The amendment filed 01 June 2004 incorrectly identifies the deletion of "adapted" by placing the word in square brackets. As this was a Bona fide attempt at an amendment, the claims have been treated as if the word was lined through in accordance to the new rules on amendments. The next version of the claims should be written as if the word "adapted" had been removed from the claim in this Response. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 16-23 and 26-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claim 16 is indefinite as it utilizes the term "adapted" to describe the "acoustic device" of the deposit removal system. The term "adapted" means "originally designed for one purpose but modified for another". In as much the Applicant has failed to identify the original purpose or the modification of the recited devices, it is not possible to determine the complete metes and bounds of the claimed invention.

Should the applicant intend the term --for-- such should be made clearer.

Claims 17-23 and 26-33 are rejected as they fail to correct the problems presented by the independent claims from which they depend.

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For the purposes of applying art, the claims have been treated as if the phrase "adapted to operate" reads --operating-- and the phrase "adapted to supply" reads --for supplying-- in each of the claims reciting the indefinite phrases. Other phrases utilizing the word "adapted" have been taken as though they were a "means plus function" phrase appropriate to the claimed invention.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 16-19 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kraus et al. (US 5,734,098)** in view of **"On-site, Near-Real-Time Monitoring of Scale Deposition"** by **D.H. Emmons, G.C. Graham, S.P. Holt and M.M. Jordan** (hereafter referred to as **Emmons et al.**) and **Edgerton (US 4,092,858)**.

**Kraus et al.** discloses a monitor to measure characteristics of fluids in an environment located above ground, the monitor having a monitoring surface that is directly exposed to fluids and a power supply for supplying electrical energy to said

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monitor, the monitor being part of a control loop for controlling the deposits in a system (see column 5 lines 5 to 48).

**Kraus et al.** discloses the claimed invention with the exception of a deposit removal system including an acoustic device exerting a physical force on the monitoring surface to at least partially remove a deposition of material from the monitoring surface.

**Emmons et al.** enhances the teachings of **Kraus et al.** by teaching at column 1, paragraph 4, of page 392 the utilization of a thickness shear mode resonator to monitor deposits in "surface equipment" in order to automate chemical feed and immediate recognition of caused by process changes.

As to the invention including a deposit removal system including an acoustic device exerting a physical force on the monitoring surface to at least partially remove a deposition of material from the monitoring surface, **Edgerton** teaches the ultrasonic cleaning of an acoustic sensor and the surfaces of the acoustic sensor exposed to a particular environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the sensor of **Kraus et al.** in view of **Emmons et al.** to provide for the cleaning of a sensor found within the system as **Edgerton** clearly teaches that such cleaning provides for a better operation of the sensor and prolongs the life of the sensor.

With regards to claim 17, both **Kraus et al.** and **Emmons et al.** teach testing fluids that are primarily fluids produced by hydrocarbon wellbores.

With regards to claim 18, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the monitoring surface on or near one of switches, valves, sleeves, mandrels, risers, subsea pipelines, downhole separators, and sensors located on surface facilities as it is well known throughout the art of wellbore monitoring that such devices are prone to scaling and that the scaling affects the operation of each one of the recited devices. As taught by **Emmons et al.**, the goal is better management of scale resulting in lowered operating costs. Therefore, one of ordinary skill in the art would want to monitor the scaling around the particular device in order to prolong the life of the device by not damaging the device due to the presence of excessive scaling or to compensate for the scaling present (as would be

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necessary should the scaling affect the output of the sensors claimed). Such actions would prolong the life of the equipment found within the wellbore and thereby lower the operating costs for the wellbore.

With regards to claim 19, **Kraus et al.** clearly discloses the monitor comprising an acoustic device operating in a resonance mode and the monitor measures deposition of material on the monitoring surface by measuring a change in resonance frequency of the acoustic device of the monitor.

With regards to claim 23, **Kraus et al.** discloses using a deposition inhibiting or removing chemical agent as part of a deposit removal system (see column 5 lines 5-48).

8. Claims 34 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kraus et al.** in view of **Emmons et al.**

**Kraus et al.** discloses a deposit monitoring apparatus located above ground comprising an acoustic device (thickness shear mode resonator) operating in a resonance mode including a monitoring surface directly exposed to fluids produced by a hydrocarbon wellbore, wherein the deposition of material on the monitoring surface is monitored by measuring a change in resonance frequency of the acoustic device and a power supply supplying said acoustic device with electrical energy.

With regards to claim 34, **Kraus et al.** discloses the claimed invention with the exception of specifically measuring the difference between a deposit of 600 microns from a deposit of 1050 microns. The system of **Kraus et al.** can easily distinguish between layers of deposits of the recited thicknesses, as the system of **Kraus et al.** is dependant upon the amount of mass deposited, not the thickness of the layer. The difference in the two layers is sufficient to alter the resonance of the resonator of **Kraus et al.** as long as the **mass** of the layers is sufficient to alter the resonance. **Emmons et al.** teaches that the sensor can detect nanograms of deposit. It is only when the weight of the deposited layer becomes too great that the sensor is overloaded that results in the sensor being unable to distinguish such small differences. As Applicant has not claimed a particular mass which would overload the system of **Kraus et al.**, the system

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of **Kraus et al.**, in view of the teachings of **Emmons et al.**, discloses the claimed invention.

With regards to claim 38, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the monitoring surface on or near one of switches, valves, sleeves, mandrels, downhole separators, and sensors located within the wellbore as is well known throughout the art of wellbore monitoring that such devices are prone to scaling and that the scaling affects the operation of each one of the recited devices. As taught by **Emmons et al.**, the goal is better management of scale resulting in lowered operating costs. Therefore, one of ordinary skill in the art would want to monitor the scaling around the particular device in order to prolong the life of the device by not damaging the device due to the presence of excessive scaling or to compensate for the scaling present (as would be necessary should the scaling affect the output of the sensors claimed). Such actions would prolong the life of the equipment found within the wellbore and thereby lower the operating costs for the wellbore.

9. Claims 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kraus et al.** in view of **Emmons et al.** as applied to claim 34 above, and further in view of **Edgerton**

With regards to claim 39, **Kraus et al.** in view of **Emmons et al.** discloses the claimed invention with the exception of the deposit removal system using the acoustic device to exert a physical force onto the deposited material. **Edgerton** teaches using an acoustic device to exert a physical force (vibration) onto deposited material in order to remove the deposited material, the removal of such deposits known in the prior art as utilizing "ultrasonic cleaning" to remove unwanted deposits from surfaces. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the system of **Kraus et al.** in view of **Emmons et al.** with a means to physically remove the unwanted deposits as **Edgerton** teaches the principles of ultrasonic cleaning in order to keep a sensor body free of deposits which would inhibit the operation of the sensor.

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With regards to claim 40, **Kraus et al.** in view of **Emmons et al.** discloses the claimed invention with the exception of the deposit removal system being near a sensor. **Edgerton** teaches the ultrasonic cleaning of an acoustic sensor and the surfaces of the acoustic sensor exposed to a particular environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Kraus et al.** in view of **Emmons et al.** to provide for the cleaning of a sensor found within the system as **Edgerton** clearly teaches that such cleaning provides for a better operation of the sensor and prolongs the life of the sensor.

***Allowable Subject Matter***

10. Claims 1 and 3-15 are allowed.
11. Claims 20-22 and 26-33 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
12. Claims 35-37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
13. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach and/or suggest a deposit monitoring apparatus located above ground comprising, in combination with the other recited elements, an acoustic device for operating in a longitudinal mode and in a resonance mode in a frequency range of 10 kHz to 250 kHz, the device including a monitoring surface directly exposed to fluids prone to causing deposition of material, wherein the deposition of material on the monitoring surface is monitored by measuring a change in resonant frequency of the acoustic device.



***Response to Arguments***

14. Applicant's arguments with regards to Claims 20 and 34 are persuasive. The rejections of these claims have been withdrawn.

15. Applicant's arguments with respect to claims 1 and 3-15 (specifically page 10 paragraph 6 of Applicant's Response) are unfounded, as these claims were not rejected under art. Applicant's amendment has overcome the non-art rejections of these claims.

16. Applicant's arguments filed 01 June 2004 have been fully considered but they are not persuasive. The rejections of claims 16-19, 23, 34, and 38-40 are hereby made final.

17. In response to applicant's argument that the bodily incorporation of Edgerton into Kraus et al. would not work (Applicant's remarks page 10, paragraph 5), the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

18. With regards to Applicant's argument in paragraph 1 of page 11 of Applicant's remarks, the "control loop" is disclosed in column 5 lines 5 to 48 of **Kraus et al.**

19. With regards to Applicant's argument in paragraph 2 of page 11, there is no recitation in the claims of protecting sensitive equipment. Therefore, the control of a chemical process is sufficient to meet the claimed invention. As to the placement of the monitoring devices, such would be well within the knowledge of one of ordinary skill in the art at the time the invention was made. One of ordinary skill in the art would know to place the monitoring devices where they would provide the best possible results for the desired test. This would include in proximity to such devices as switches and valves.

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20. With regards to Applicant's argument in paragraph 3 of page 11, **Kraus et al.** does not have to teach a monitoring surface similar to the monitoring surface of the disclosed invention. The monitoring surface of **Kraus et al.** meets the claimed invention which is all that is required. The invention as claimed does not perform an "analysis" of the deposits as argued. The monitoring surface merely collects the deposits such that the resonance of the acoustic device is changed when the amount of deposits is changed.

21. With regards to Applicant's argument in paragraph 4 of page 11, the rejection of claim 20 has been withdrawn.

22. With regards to Applicant's argument in paragraph 5 of page 11, the "addition of the chemical treatment" of **Kraus et al.** meets the claimed invention as the chemical is used to fix a processing problem which inherently would include removal of the deposits as the system properly processes the fluid in the system, especially in the system which utilizes an "emulsion breaking material" which would remove the deposits as the emulsion is broken down.

23. With regards to Applicant's argument in paragraph 1 of page 12, the rejection of claim 26 has been withdrawn.

24. In response to applicant's argument as found in paragraph 2 of page 12 that the references do not specifically disclose a relationship between thickness and the amount deposited as found in Claim 34, a recitation of the intended use of the claimed invention (measurement of thickness instead of a measurement of mass) must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as

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compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

25. With regards to Applicant's argument in paragraph 3 of page 12, the rejection of claim 35 has been withdrawn.

26. With regards to Applicant's argument in paragraph 4 of page 12, there is no recitation in the claims of protecting sensitive equipment. Therefore, the control of a chemical process is sufficient to meet the claimed invention. As to the placement of the monitoring devices, such would be well within the knowledge of one of ordinary skill in the art at the time the invention was made. One of ordinary skill in the art would know to place the monitoring devices where they would provide the best possible results for the desired test. This would include in proximity to such devices as switches and valves.

27. In response to applicant's argument that the bodily incorporation of the "cavitations" taught by Edgerton into the systems of Kraus et al. and Emmons et al. is not possible (with regards to claims 39 and 40 and as found in the paragraph bridging pages 12 and 13 and in the second complete paragraph of page 13 of Applicant's Response), the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

28. With regards to Applicant's argument in the first full paragraph of page 13 of Applicant's remarks, the "control loop" is disclosed in column 5 lines 5 to 48 of **Kraus et al.** with regards to the control processing of the system.

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**Conclusion**

29. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rose M Miller whose telephone number is 571-272-2199. The examiner can normally be reached on Monday - Thursday, 7:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
RMM  
23 August 2004

  
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